

***Grand Avenue  
Northwest Corridor Study***

***DRAFT***

***POTENTIAL LONG-TERM  
INVESTMENT CONCEPT***

***February 16, 2001***

***Prepared for***



***Prepared by***

**URS**

***In association with BRW and A. Dye Design***

## ***PRELIMINARY CONCEPTS***

A major goal of the Grand Avenue Northwest Corridor Study is to identify the long-term roadway concept for the corridor. The process for identifying major infrastructure improvements has included consultation from local jurisdictions, input from the public, and two Agency/Community Forums. Initial preliminary concepts were developed based on ideas and comments received during this process. Three preliminary long-term concepts for the Grand Avenue Northwest Corridor were presented at the Agency/Community Forum on November 14, 2000. These included:

### Concept 1 – Enhanced Arterial

Widen Grand Avenue to a six-lane arterial street between Loop 101 and Loop 303. Improve at-grade intersections and provide signal coordination.

### Concept 2 – Limited Expressway

Widen Grand Avenue to a six-lane expressway between the 107<sup>th</sup> Avenue and Loop 303. Depress Grand Avenue and maintain a 4-lane divided highway with southwest side frontage road between Loop 101 and 107<sup>th</sup> Avenue. Construct a series of grade separations at major intersections. Extending frontage roads and restricting access to right turn egress and ingress only. Traffic signals would remain at several locations.

#### Potential Grade Separations

- 99<sup>th</sup> Avenue traffic interchange (Grand depressed)
- 103<sup>rd</sup> Avenue overpass (Grand depressed)
- 107<sup>th</sup> Avenue traffic interchange (Grand at-grade)
- El Mirage Road overpass (Option A and/or B)
- Railroad Spur overpass near Greenway (Grand depressed)
- Bell Road traffic interchange (Grand depressed)
- Reems/ Meeker interchange (Grand at-grade)
- Sunrise/RH Johnson traffic interchange (Grand depressed)

#### Other Features

- Right turn egress and ingress only at Dysart Road
- Two-way frontage road between Dysart and Bell

### Concept 3 – Full Expressway

Construct a full expressway concept with complete access control.

Based on input at the November 14, 2000 Agency/ Community Forum and comments received subsequent to the Forum, Concept 2 was chosen for further evaluation and refinement. Direction was given for the purposes of this study to not longer consider a full expressway for Grand Avenue. The ultimate concept for Grand Avenue will be addressed as part of the update to the MAG Regional Transportation Plan which is currently underway. A meeting to discuss refinements to Concept 2 was requested by the City of Surprise and the City of El Mirage.

Minutes from this meeting held on December 20, 2000 are included in the appendix. Concept 2 was revised based on all comments received to date to include six potential grade separations as part of a limited expressway.

Concept 1 and Concept 3 were eliminated from further consideration. Concept 1 was eliminated because it does not provide relief from the railroad for emergency vehicles and does not do enough to reduce congestion and improve travel along Grand. Concept 3 was eliminated because of the large impacts to existing land uses and elimination of access. It is apparent a full expressway type improvement along Grand Avenue would be extremely disruptive to residences, businesses, and the railroad and very expensive to design and build. An additional 100 to 150 feet of right-of way would be needed throughout the corridor.

The revised Concept 2 (Limited Expressway) is presented below to facilitate discussion. The attached drawings illustrate the concept graphically. Depending of input at the Agency/Community Forum, public input, current funding sources, and technical issues, not all of the potential improvements developed as part of the concept may be recommended for implementation in the final report.

### **CONCEPT 2 (REFINED): LIMITED EXPRESSWAY**

Widen Grand Avenue to a six-lane expressway between Loop 101 and Loop 303. Upgrading Grand Avenue to a limited expressway includes constructing six grade separations, eliminating nine traffic signals and eight other median breaks along Grand Avenue, and providing intelligent transportation system (ITS) applications for the corridor. Traffic signals would remain at several major street intersections. Concept components include:

- Widen Grand Avenue to six-through lanes and providing exclusive turn lanes at signalized intersections. Widening Grand Avenue requires widening/reconstructing the existing bridge over the New River.
- Extend the ITS “Smart Corridor” along Grand Avenue from Bell Road to Loop 303. Provide a conduit along Grand Avenue for fiber-optic communications to support Smart Corridor traffic management functions. Implement additional ITS applications consistent with the MAG ITS Strategic Plan such as signal coordination.
- Six grade separations along Grand Avenue (reflecting local requests)
  1. Single Point Urban Interchange (SPUI) @ Grand Ave/107<sup>th</sup> Ave intersection (Boswell Memorial Hospital), where 107<sup>th</sup> Avenue would be an underpass below Grand Avenue and the BNSF Railroad which would both stay at-grade. The tight existing right-of-way requires Grand Ave. to be realigned slightly to the south to make room for the northwest bound on/off-ramps abutting the railroad right-of-way. This interchange would provide direct access to Boswell Memorial Hospital. The existing crossroad skew is approximately 18 degrees at this location. Approximately 91 feet of new right-of-way is needed. The interchange would likely require the relocation of shopping centers on both sides of 107<sup>th</sup> Avenue, south of Grand Avenue.

An alternative to this interchange is a grade separation at 103<sup>rd</sup> Avenue. 103<sup>rd</sup> Avenue would be an underpass below Grand Avenue and the BNSF Railroad which would both stay at-grade. Access to 103<sup>rd</sup> Avenue from adjacent businesses would be disconnected through the depressed section. There would be no ramps to 103<sup>rd</sup> Avenue, however, ramps could be added but would result in additional impacts. A traffic signal would remain at 107<sup>th</sup> Avenue.

A second alternative to the interchange at 107<sup>th</sup> Avenue would be a tunnel under Grand Avenue and the BNSF railroad located between 103<sup>rd</sup> Avenue and 107<sup>th</sup> Avenue. The tunnel would provide one-way inbound access to the hospital. An northwest bound and southeast bound ramp from Grand Avenue would be provided. Use of the tunnel would only be for emergencies. This alternative could impact a residential area.

2. Half Diamond & T-intersections @ Grand Ave/Thompson Ranch Rd. intersection, where El Mirage Road would be extended past Thompson Ranch Road with an overpass bridge at Grand Avenue and the BNSF Railroad which would both stay at-grade. This new overpass roadway would be extended southward to Olive Avenue or Northern Avenue and would tie to El Mirage Road to the north. A half diamond on the south and a two-way connector road with signals to the north would provide access to Grand Avenue. The proposed crossroad skew is approximately 7 degrees at this location. The existing signal at Thompson Ranch Road and Grand Avenue would remain.
3. Grand Ave Underpass at BNSF Railroad Spur Track, where Grand Avenue would be an underpass below the BNSF Railroad Spur Track. The traffic signal at Primrose Street would be removed because the intersection falls within the depressed section of Grand Avenue.
4. Tight Diamond @ Grand Ave/Greenway Rd intersection, where Greenway Road would be underpass below Grand Avenue and the BNSF Railroad which would both stay at-grade. A SPUI cannot be utilized here because of the highly skewed crossroad (45 degrees). Greenway Road would be improved to El Mirage Road, north of Grand Avenue and to Litchfield Road south of Grand Avenue. The Greenway Road improvement south of Grand Ave. to Litchfield Road would become an attractive alternate for Bell Road traffic wanting to access Grand Avenue. The tight existing right-of-way requires Grand Avenue to be realigned slightly to the south to make room for the northwest bound on/off-ramps abutting the railroad right-of-way. Approximately 29 feet of new right-of-way is needed. The interchange would likely require the relocation of a building at the Floral Lakes Memorial Gardens Cemetery and the relocation of three to four businesses south of Grand Avenue and east of Greenway Road. The two-way frontage road would also be realigned.
5. Tight Diamond @ Grand Ave/Bell Rd. intersection (Del E. Webb Memorial Hospital), where Bell Road would be an underpass below Grand Avenue and the BNSF Railroad which would both stay at-grade. A SPUI cannot be utilized here because of the highly skewed cross road (45 degrees). Approximately 23 feet of new right-of-way is needed.

The interchange would likely require the relocation of part of the shopping center being built on the east side of Bell Road south of Grand Avenue. The traffic signal into the Home Depot shopping center would be removed because of its close proximity to the interchange ramps. Likewise, the planned signal immediately east of Bell Road would also need to be removed (or not constructed).

6. SPUI @ Grand Ave/Reems Rd intersection, where Reems Road would be underpass below Grand Avenue and the BNSF Railroad which would both stay at-grade. The existing cross road skew is minimal at this location. This interchange would provide direct access to Del E. Webb Memorial Hospital. Approximately 74 feet of new right-of-way is needed. The interchange would likely require the elimination/relocation of shopping centers on both sides of Reems Road, south of Grand Avenue.

An alternative to the interchange at Reems/Meeker would be a tunnel under Grand Avenue and the BNSF railroad located west of Reems Road. The tunnel would provide one-way inbound access to the hospital. An northwest bound and southeast bound ramp from Grand Avenue would be provided. Use of the tunnel would only be for emergencies.

- Elimination of nine traffic signals along Grand Avenue.
  - 4 at proposed traffic interchanges
    - Parkview Place (to close to Reems/Meeker interchange)
    - Primrose Street (within Grand Avenue depressed section)
    - Home Depot (to close to Bell Road interchange)
    - Planned signal to shopping center (to close to Bell Road interchange)
    - 113<sup>th</sup> Avenue (to close to 111<sup>th</sup> Avenue)
- Look for opportunities to eliminate access along Grand Avenue including eliminating median breaks at the following unsignalized intersections:
  - Beardsley Road
  - Sunny Lane
  - Shopping Center, east of Greenway Road
  - 108<sup>th</sup> Avenue
  - 106<sup>th</sup> Avenue
  - 105<sup>th</sup> Avenue
  - 101<sup>st</sup> Avenue
  - Median break, east of 99<sup>th</sup> Avenue

## **SUMMARY**

Concept 2 (Limited Expressway) was identified for further evaluation and refinement. The refined concept includes a combination of upgrading Grand Avenue to a 6-lane limited expressway, adding turn lanes at intersections, eliminating nine signalized intersections, adding ITS infrastructure and adding six grade separation (two of which would serve local hospitals). A limited expressway would greatly improve safety and local mobility of the corridor and offer more free-flow regional transportation alternatives. The proposed interchanges near the local

hospitals would provide free-flow conditions to/from Grand Avenue and across Grand Avenue and the railroad. This concept would meet the many of the objectives and goals developed for the Grand Avenue Northwest Corridor Study. The remaining goals will be addressed later in the study.

Depending on input at the Agency/Community Forum, public input and current funding sources, not all of the potential improvements developed to date may be recommended for implementation in the final report. Several of the components of Concept 2 are local circulation improvements and would not be ADOT projects and would be the responsibility of the county or local jurisdictions. The impacts of potential grade separations, signal elimination and access control on adjacent development would be a major consideration in the determination of a final recommendation.

## ***APPENDIX***

## MEMO

Date: February 16, 2001

To: Northwest Grand Corridor Study Team

From: Pat Salerno

Subject: **Northwest Grand Avenue Coordination Meeting**

This memorandum summarizes information gathered during a site visit and office meeting held at the City of Surprise engineering building on the Northwest Grand Corridor Study. The meeting took place on Wednesday, December 20, 2000 @ 9:30 am. A subsequent field drive occurred after the meeting.

The following people were in attendance:

<b>Roger Herzog</b>	<b>MAG</b>
<b>Chris Voigt</b>	<b>MAG</b>
<b>Ellis Perl</b>	<b>City of Surprise Engineer</b>
<b>Gabe Gonzalez</b>	<b>City of Surprise Assistant Engineer</b>
<b>Carrol Reynolds</b>	<b>City of El Mirage Engineer</b>
<b>Dave French</b>	<b>URS Corp.</b>
<b>Pat Salerno</b>	<b>URS Corp.</b>

The following is a summary of items discussed and decisions reached:

**City Of Surprise Specific Issues** *(A City of Surprise General Plan Update was distributed to URS. Additional information can be obtained through the City of Surprise web site at [www.2020surprise.org](http://www.2020surprise.org))*

- Significant population and traffic growth is anticipated for the City of Surprise and surrounding areas. It is estimated the population for the City of Surprise will grow to 300,000 and encompass 250 square miles by year 2020.
- A new downtown area will be developed over the next 10 years within the square mile bounded by Litchfield Rd., Bell Rd., Bullard Rd., and Greenway Rd., and will consist of City Hall, businesses, offices, schools, health/rec. centers, a library, etc. A new Cactus League baseball park is planned for the adjacent area between Bullard Rd. and Parkview Rd.
- The Dysart School District is planning new schools in the area and a junior high school is currently under construction at the intersection of Litchfield and Greenway Rds. Tom Murphy is contact on Dysart School District issues.
- A five star resort is planned in the vicinity of the White Tank Mountains on State trust lands.
- Commercial, industrial, and residential development is occurring at numerous sights along the Grand Ave. corridor and along many cross streets near Grand Ave. A large shopping center complex, with Home Depot and WalMart as anchor stores, is being developed on the west side of Grand Ave. north of Bell Rd. This development has driveway access on Bell Rd. close to Grand Ave. making it difficult for a Bell Rd. underpass TI at Grand Ave.



- A developer has plans to add a new retail development on the west side of Grand Ave south of Bell Rd. Access to this site is proposed at a new signalized intersection along Grand Ave. approximately 600 ft. southeast of Bell Rd. The City has approved this development and intersection location and mentioned ADOT has approved it as well. URS will contact George Chin @ ADOT to confirm ADOT's approval of this intersection, which would severely restrict the possibility of making a Grand Ave. underpass TI at Bell Rd.
- Mountain View Rd. is planned to be extended southeast from Reems Blvd. and will hook north to tie to Grand Ave. at a new signalized intersection. Del Webb owns the lands adjoining Mountain View Rd.
- It is important for Dysart Rd. to maintain full access at Grand Ave and not be disrupted.
- The City is planning to rebuild the Dysart/Waddell-Thunderbird intersection to better align the railroad spur track into the center of the intersection. A new light industrial development is planned just south of the intersection and will likely increase rail traffic along the spur track.
- A County signal timing study is on-going along Bell Rd. between Loop 101 and 303 but recommendations from this study may be inadequate in relieving congestion and overpasses may be needed along Bell Rd. instead.
- The neighborhood bounded by Bell Rd. and El Mirage Rd. along the north side of Grand Ave. is sensitive to through traffic continuing to cut through their neighborhoods and desires improvements to El Mirage Rd. that is being improved to 4 lanes south of Paradise Lane. Thompson Ranch Rd. is being extended northwest to connect to El Mirage Rd. near Greenway Rd. This will reduce traffic turning west at Greenway Rd. and most likely lessen cut through traffic in the neighborhood.

### **City Of El Mirage Specific Issues**

- It is important to maintain full access to Grand Ave. from Waddell-Thunderbird Rd. to the southwest. An interchange at this location does not appear feasible at this time so the City would like to maintain at-grade access. An option to be pursued is a new overpass just to the east of the Grand Ave/Waddell-Thunderbird Rd. intersection that is an extension of El Mirage Rd./Thompson Ranch Rd. to the north. This overpass roadway could continue south along the west side of the Aqua Fria River and tie to a recently completed perimeter roadway along the east side of a new subdivision adjacent to the river flood plain. Any encroachment of a new roadway into the Aqua Fria River flood plain will need to be evaluated.
- Thompson Ranch Rd. intersection at Grand Ave. must be maintained, especially since it is being extended to El Mirage Rd. to the northwest. This intersection will need to be worked into the overpass concept described above.

### **General Discussion**

- The general consensus from the group was that much of the existing conditions and current development severely restricts underpass/overpass options at many of the intersections. For the majority of the corridor, an enhanced arterial with 3 lanes in each direction, improved left and right turn bays, and more efficient traffic signalization is all that can reasonably be accomplished along the corridor, therefore this concept will be evaluated further with the following exceptions. Safe and unobstructed access to/from Grand Ave. to the two hospitals along the corridor are considered very important and underpass/overpass concepts should be developed further to allow safe, free-flow access across the railroad tracks during train operations. The five locations where underpass/overpass options are to be further developed are as follows;
1. A Reems/Meeker Blvd. TI will be evaluated to provide full access at the Del Webb Memorial Hospital Campus. A Reems/Meeker Blvd. underpass is probably more feasible at this location than an underpass. A TI at the Sunrise/RH Johnson Blvd. intersection is not to be considered further.

2. A 103<sup>rd</sup> or 107<sup>th</sup> Ave. TI will be evaluated to provide full access at the Boswell Memorial Hospital Campus. A 107<sup>th</sup> Ave. underpass appears to be the more feasible of the two locations. A TI at the 99<sup>th</sup> Ave. intersection is not to be considered further.
  3. Two TI concepts at the Grand Ave./Bell Rd. intersection will be evaluated, one with Grand Ave. as underpass and one with Bell Rd. as underpass.
  4. A grade separation concept will be developed for Greenway Rd. at Grand Ave. After field review, a Greenway underpass appears to be more feasible at this location. Include recommendations for improvements on Greenway Rd. south of Grand Ave. that would make Greenway Rd. a more desirable route and lessen traffic on Bell Rd. A pedestrian bridge or other mitigation may be needed on Greenway Rd. to allow children to access the existing school just east of Dysart Rd.
  5. A grade separation concept will be developed for the EL Mirage/Thompson Ranch Rd. extension. A cross road overpass appears to be more feasible at this location. The Thompson Ranch Rd. intersection with Grand Ave. will need to be worked into the overpass concept.
- In all concepts that involve a new overpass or underpass cross road, the conveyance of storm water flows in existing open channel ditches on both sides of Grand Ave. will need to be to be considered. These ditch flows will need to be maintained across new ramps or new raised/depressed roadways.
  - Typical overpasses over roadway/railroad lines (23.5 ft. clearance) require approximately 2500 ft. of length before tie-in (approximately 1250 ft. each side of crossing) Typical underpasses beneath roadway/railroad lines (16.5 ft. clearance) require approximately 1600 ft. of length before tie-in (approximately 800 ft. each side of crossing)
  - A consideration to lessen traffic on this section of Grand Ave. is to emphasize Olive Ave. as a way in and out of the Surprise, El Mirage and Sun City areas. It is believed the emphasis will be from Loop 101 west. A connection from Grand Ave. to Olive Ave. west was not as important.

### **Field Review Items**

- The major ditch on the north side of Grand Ave. in the Sun City area does originate at 107<sup>th</sup> Ave. and flows both easterly and westerly from there, draining into New River to the east and the Aqua Fria River to the west.
- Grand Ave. currently is a 6-lane section between 99<sup>th</sup> Ave. and 103<sup>rd</sup> Ave. and is a 4-lane section for the remainder of the corridor. The tightest existing right-of-way along the corridor is 130 ft. which would allow for a new continuous 6-lane arterial roadway section with adequate turn lanes.
- The existing Grand Ave. bridge over Loop 101 is as follows; 2 WB through lanes and 2 WB left turn lanes, and 2 EB lanes with extra room for at least one more EB lane.
- The existing Grand Ave. bridge over New River is as follows; 2 through WB lanes and 2 through EB lanes on separate structure. These bridges do not fully line up with the existing bridge over Loop 101 and will need reconstruction to widen and shift their alignment.
- Sunny Lane traffic cannot turn left onto Grand Ave. but Grand Ave. traffic can turn left onto Sunny Lane.
- There is currently a signal at the Primrose Lane/Grand Ave. intersection that may be eliminated once other improvements are constructed.